



Syngas Platform Vienna



**Gasification of residues and
synthesis of fuel and
chemicals**

Doris Matschegg, BEST

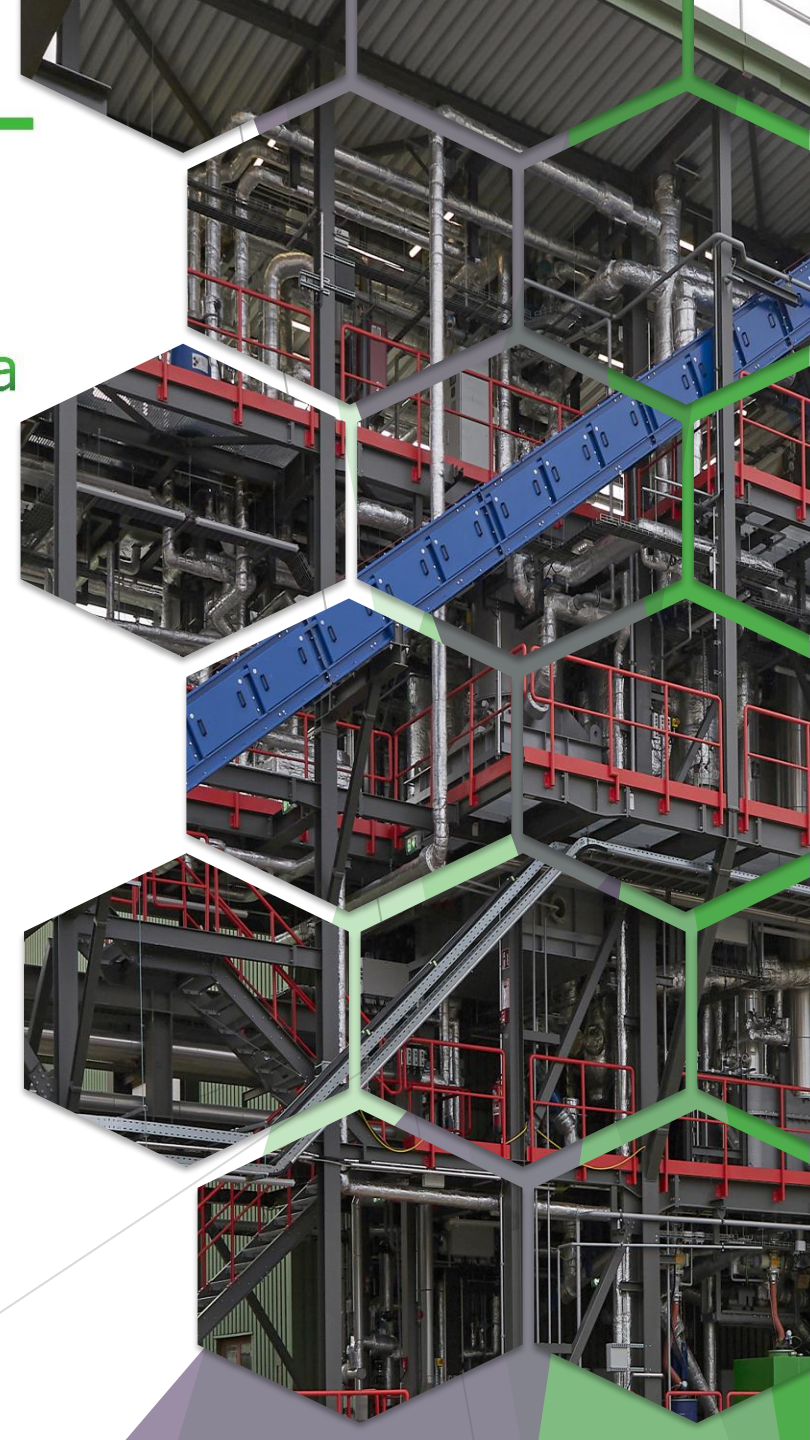
Technical Expert Workshop

Towards Sustainable Aviation: From Innovative Fuel Pathways to Scale-up

6th of October 2026



The BioTheRoS Project has received funding from the European Union's Horizon Europe research and innovation programme under Grant Agreement No. 101122212.



Agenda

- ▶ BEST
- ▶ Syngas Platform Vienna
- ▶ Full chain demonstration within BioTheRoS

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BEST

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BEST in a nutshell

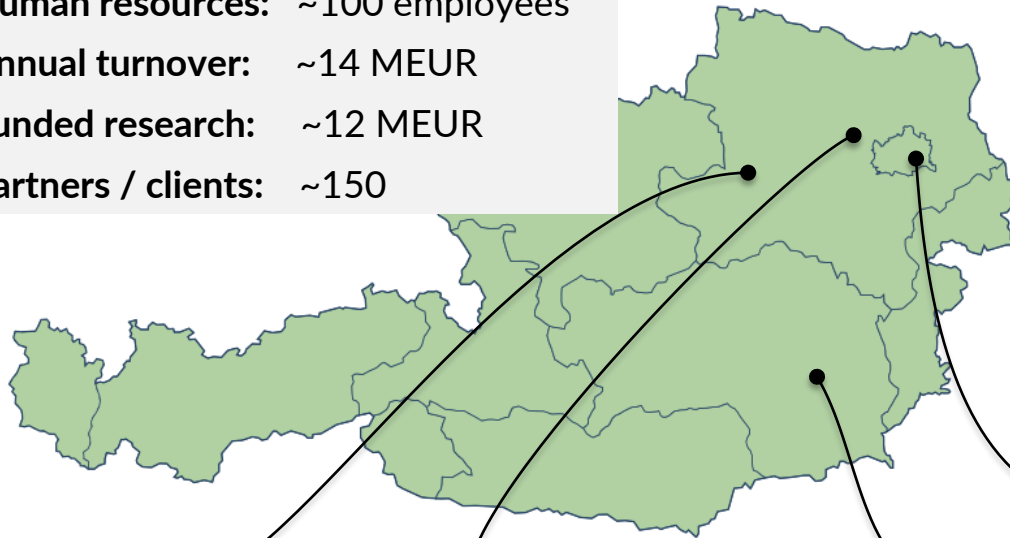
Bridging the gap between fundamental research and industrial deployment with RTD services to shape the transition to a sustainable and climate friendly bioeconomy

Human resources: ~100 employees

Annual turnover: ~14 MEUR

Funded research: ~12 MEUR

Partners / clients: ~150



Wieselburg, Lower



Tulln, Lower



Graz, HQ, Styria



High value products
from residues and
waste



Economic and efficient
renewable energy
systems

Vienna

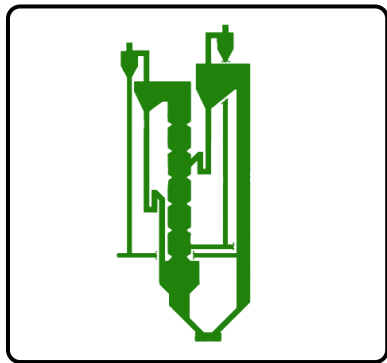




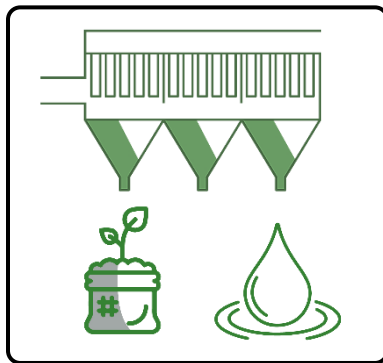
Area 1.3: Syngas Platform Technologies

TECHNOLOGY DEVELOPMENT enabling SUSTAINABLE PROCESS CHAINS in INDUSTRIES

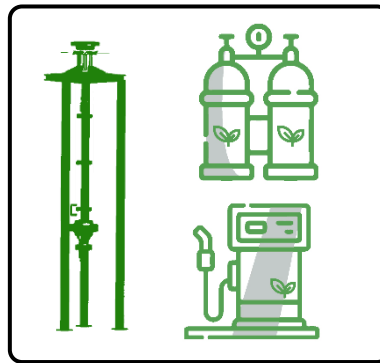
Strategic fields of action



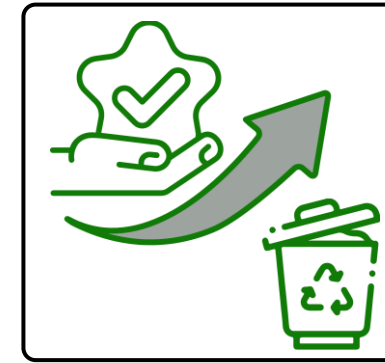
Dual fluidized bed
(DFB) processes



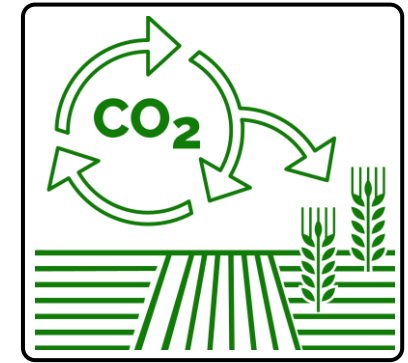
Linking process
chains



Gas upgrading and
synthesis



High value
products from
residues



Negative emissions

**Lab-, pilot- and demonstration-scale infrastructure for
experimental de-risking to enable industrial implementation**

Agenda

▶ BEST

Syngas Platform Vienna

▶ Full chain demonstration within BioTheRoS



SYNGAS PLATFORM VIENNA

A **research hub** featuring a Waste2Value process chain: 1 MW **DFB gasification** + 250 kW **Fischer-Tropsch** synthesis demo

A connected **laboratory** supplied **with real syngas** for gas cleaning and upgrading

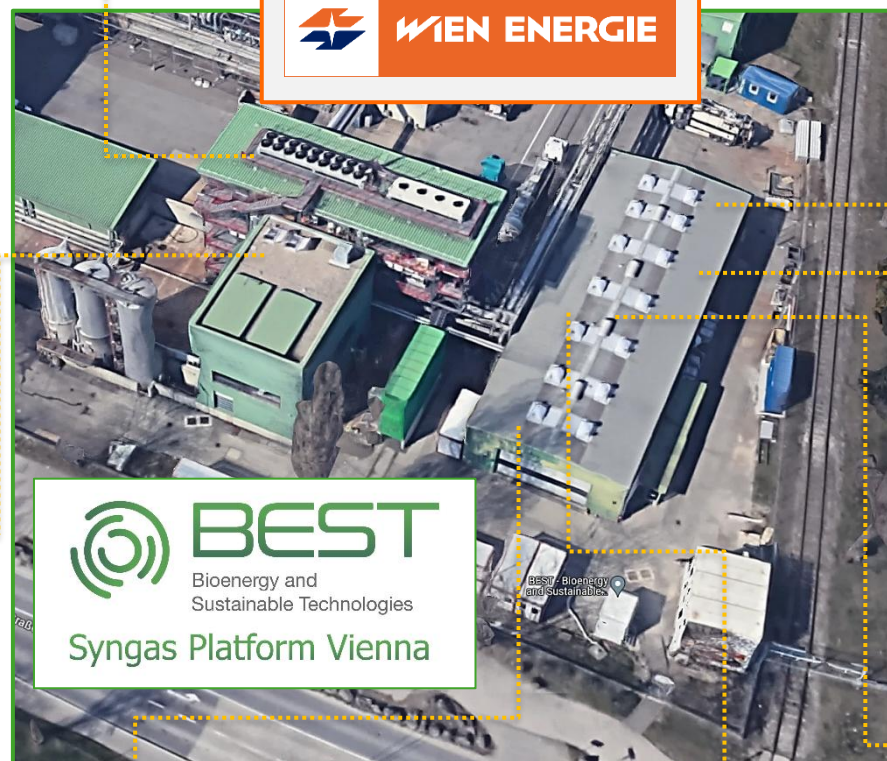
Syngas Platform Vienna



DFB Gasification demo



Fischer-Tropsch pilot



BEST
Bioenergy and
Sustainable Technologies
Syngas Platform Vienna



Industrial site of

WIEN ENERGIE



Fischer-Tropsch



Aqueous phase reforming



Feedstock containers



Analytics lab

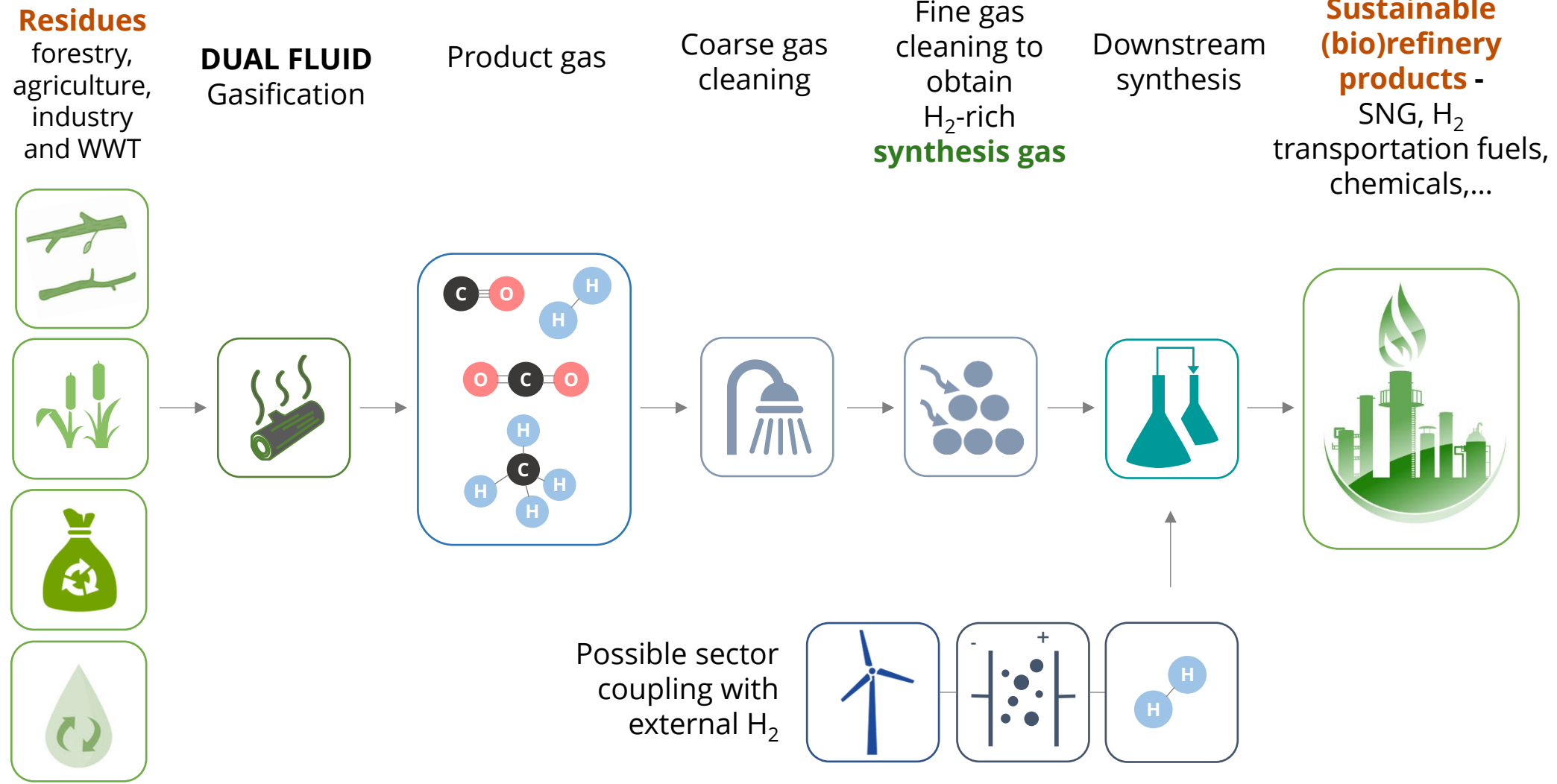


Temperature swing
adsorption



Technologies

Process Overview

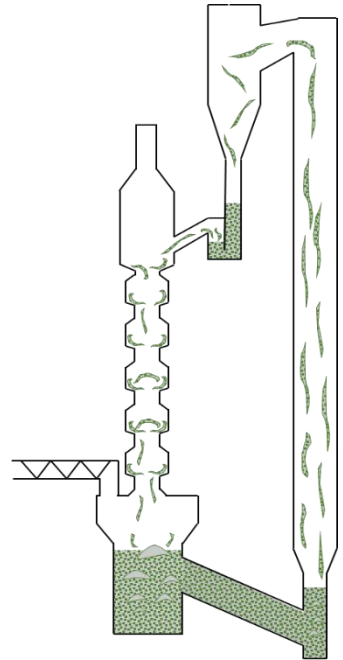


Syngas Platform Vienna: experimental equipment



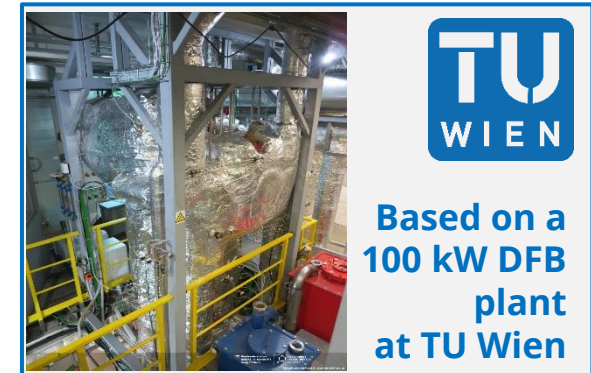
Dual fluidized bed (DFB) gasification:

- 1 MW demonstration-scale plant for long-term campaigns of multiple weeks continuous operation
- Advanced DFB gasification (aDFB) reactor design upscaled from 100 kW



Typical syngas composition

H_2	CO	CO ₂	CH ₄	C ₂ H ₄
41%	24%	23%	10%	

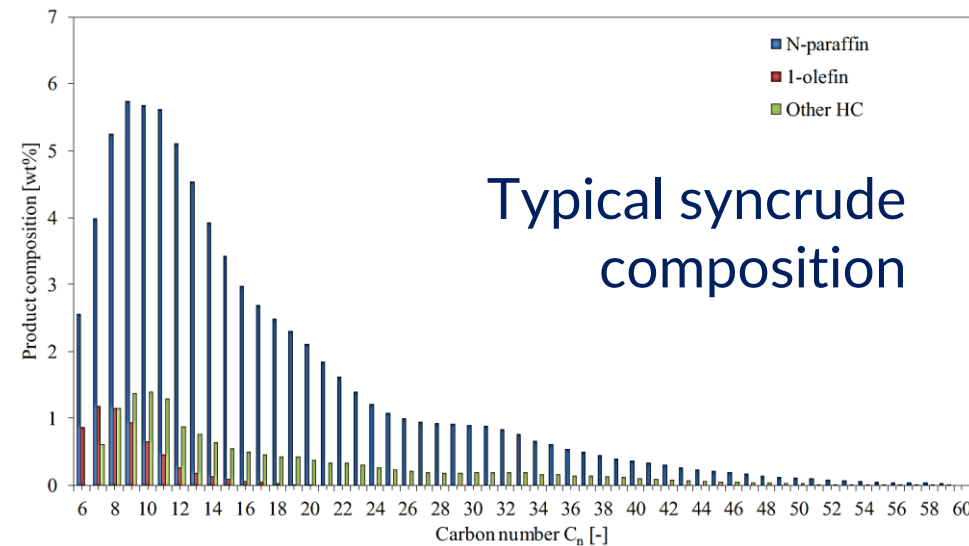
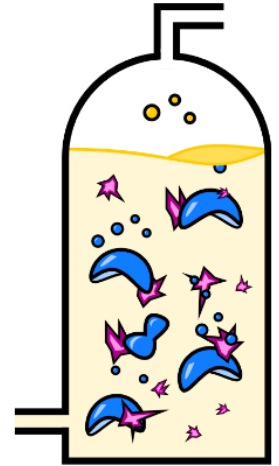


Syngas Platform Vienna: experimental equipment



Slurry-Bubble-Column-Reactor (SBCR):

- 250 kW pilot-scale Fischer-Tropsch plant for long-term campaigns of multiple weeks continuous operation
- Gas cleaning includes hot filtration, a quench, solvent scrubbers, activated carbon filters and ZnO filters



Agenda

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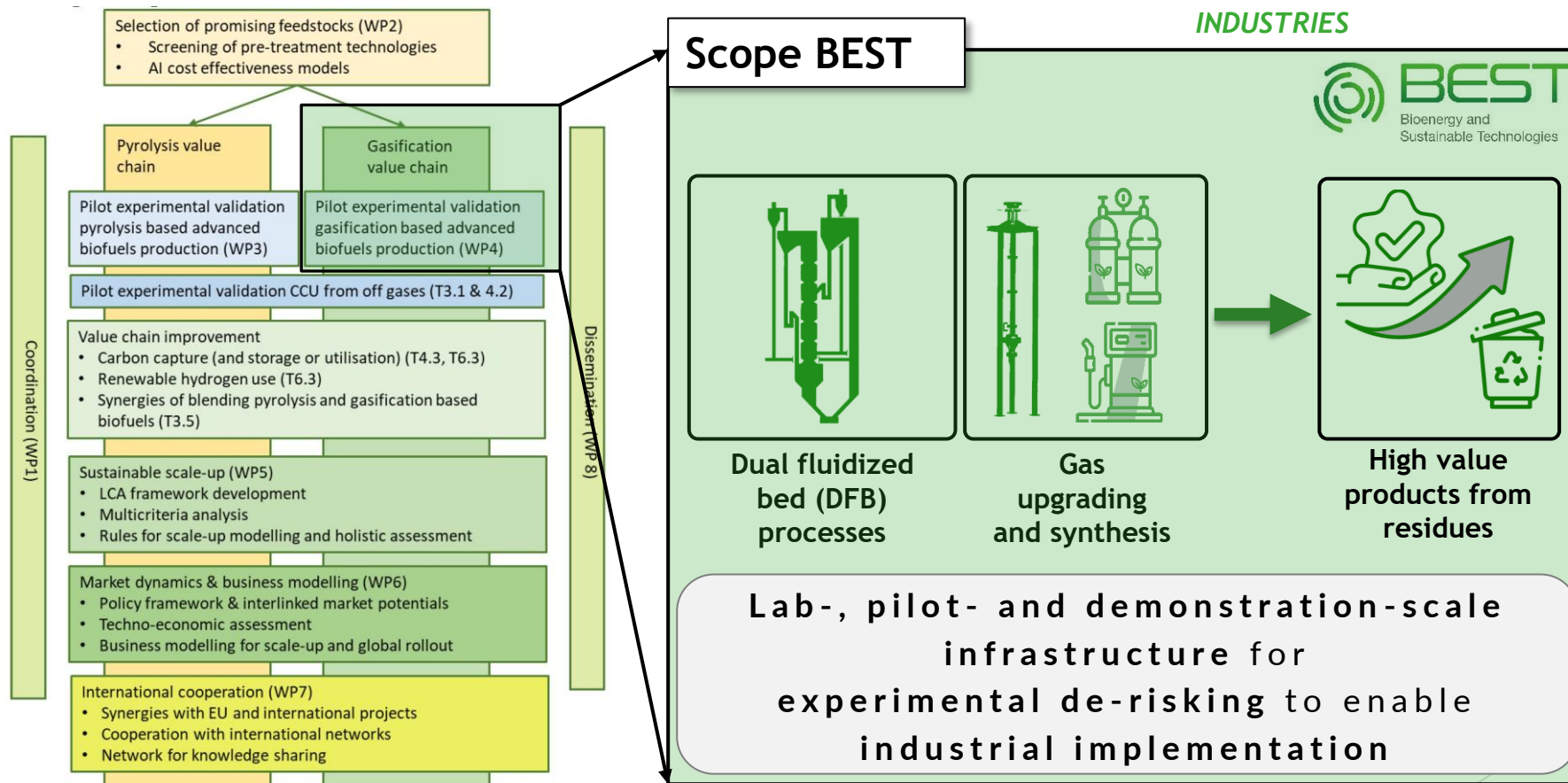
Full chain demonstration within BioTheRoS

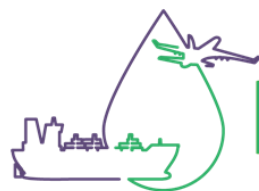


BioTheRoS - At a glance

Collaborative actions to bring novel **BIO**fuels **THER**mochemical **RO**utes into industrial Scale

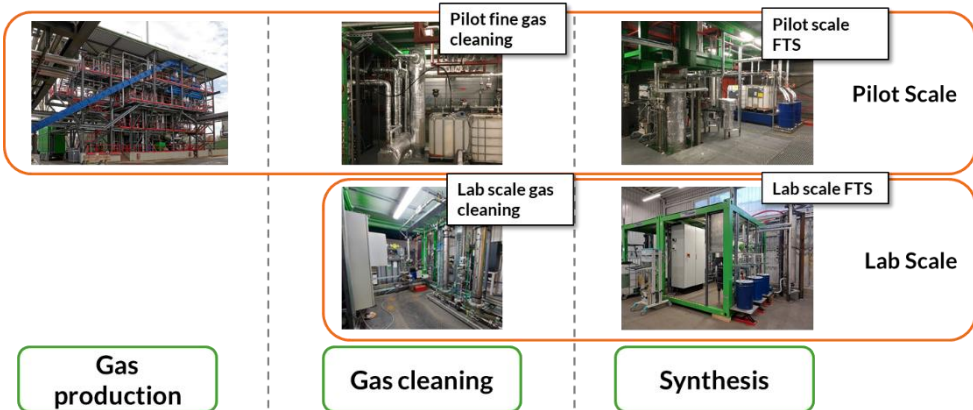
TECHNOLOGY DEVELOPMENT enabling
SUSTAINABLE PROCESS CHAINS in
INDUSTRIES





BioTheRoS - Gasification value chain

Collaborative actions to bring novel **BIO**fuels **THER**mochemical **RO**utes into industrial Scale



Main activities



- Gasification of biogenic waste feedstock
- Screening on gas impurities and gas cleaning strategies
- Operation of full process chain and production of FT raw product

FT raw product



Information

Main activities



- Hydrocracking of FT raw product
- Integration of carbon capture technology into thermochemical processes
- Simulation and modelling for scale-up of gasification process

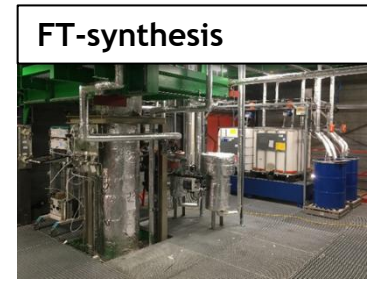
Coordinator





BioTheRoS - Gasification value chain

Collaborative actions to bring novel **BIO**fuels **THE**rmochemical **RO**utes into industrial Scale



Full Gasification value chain operation

Gas
production

Gas cleaning

Synthesis

FT raw product



Hydrocracking of FT raw product



CERTH
CENTRE FOR
RESEARCH & TECHNOLOGY
HELLAS

Full chain demonstration successfully accomplished!

- Results



Aim:

Investigation of biogenic waste feedstocks for gasification value chain for the production of advanced biofuels



Achievements and key results:

- ▶ Stable operation of full process chain overall several days with waste feedstock
- ▶ Assessment of gas impurities and gas cleaning performance
 - ▶ Separation efficiencies: PAH >99 % Benzene >99.8 % Toluene >99.9 % Xylene >99.9 % H₂S >99.9 % COS >99.9 % Thiophene >99.8 % NH₃ >99.9 % HCN >99 %
- ▶ Production of FT-syn crude for further processing by CERTH
 - ▶ Overall CO conversion of 70–85 %; chain growth probability $\alpha = 0.87$, close to the optimum of 0.9.





BioTheRoS - Key lessons and next steps

Collaborative actions to bring novel **BIO**fuels **THE**rmochemical **RO**utes into industrial Scale



Take aways:

- ▶ Biogenic waste materials can effectively serve as feedstock for gasification with minor effect on syngas quality
- ▶ Higher amounts of impurities sufficiently reduced to necessary levels for synthesis
- ▶ Approved usage of waste feedstock to improve economics



Next steps:

- ▶ Dissemination of results – Publication in progress
- ▶ Scale-up assessment, techno-economic analysis and life-cycle assessment by project partners



Thank you!



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<https://www.biotheros.eu/de/startseite/>



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